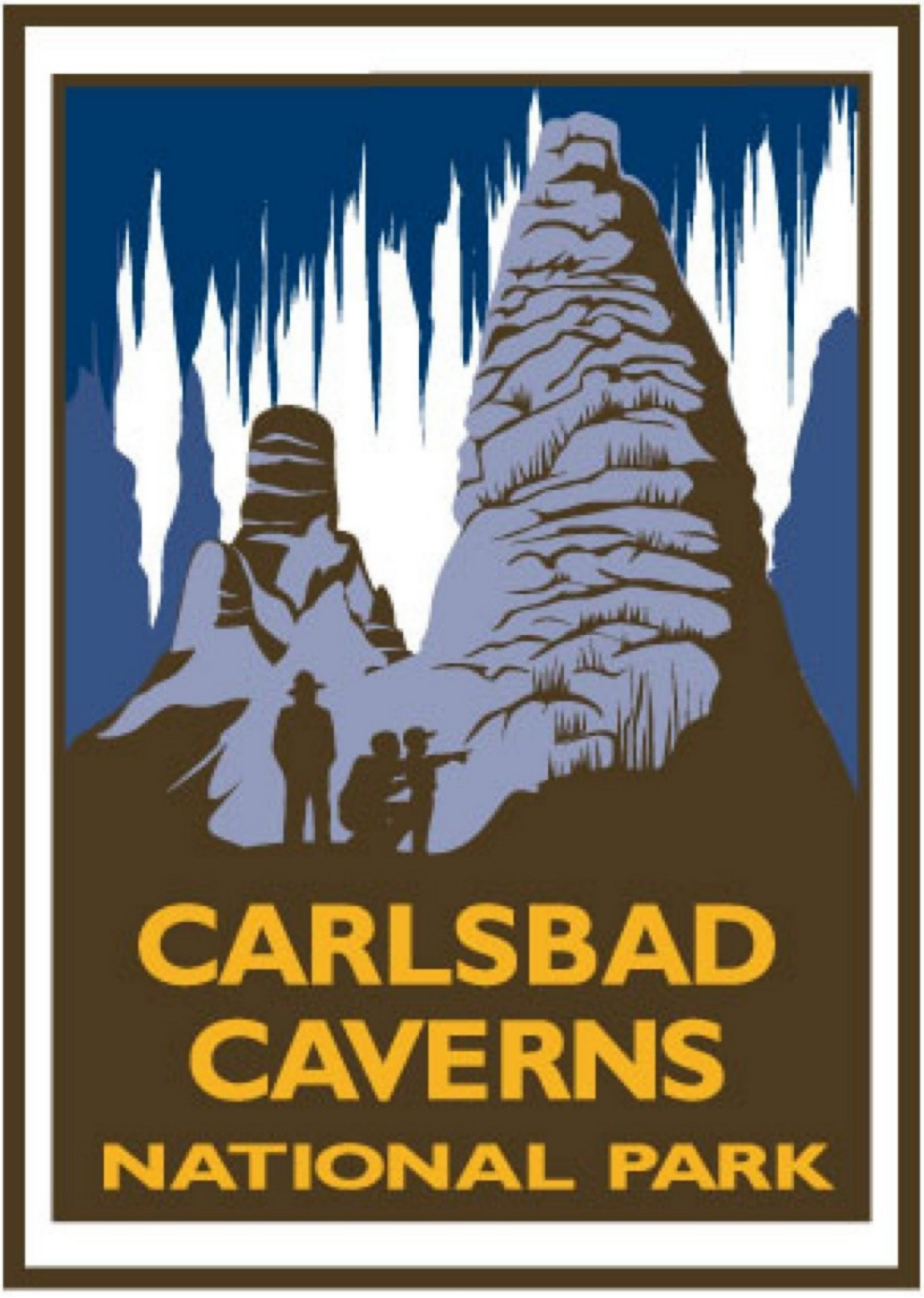
About Bats, Caves, & Deserts

A curriculum and activity guide for Carlsbad Caverns National Park

Elementary School



Section 9 – Fire Activities

- **Fire!**
- **Fire on the Run**
- **Firefighting**
- **Spark!**

Fire!

Pre-Visit, Field Trip and Post-Visit Activities

Intermediate and Secondary Levels

Science (Inquiry, Life)

Language Arts (Expressive Language, Research and Synthesis)

Four 45-Minute Sessions plus Field Trip

Objective(s). Student will identify positive and negative effects of fires.

Students will communicate their investigations to others.

Related NM Content Standards with Benchmarks. SC6-M1, SC6-M-6, SC6-H6, LA5-M3, LA5-H3, LA10-H4

Method. Students conduct field investigations and present their conclusions.

Material. plant and animal identification guides, notebook and pencil for each student, various materials depending upon the presentations

Key Vocabulary. wild fire, controlled fire, prescribed burn, management ignited fires

Background. Management ignited fires have been evident recently in government agencies, since more benefits of fire are known. These planned burns reduce fuel loads, thus preventing fires from getting too hot and burning all life from an area.

When Smokey Bear says, “Only you can prevent forest fires,” he is talking about people causing fires through carelessness such as not attending their campfires. Fires can be so hot that they kill most of the plant life. Some fires move so fast that animals do not have enough time to escape. However, there are benefits. Fires increase soil productivity by recycling nutrients, opening up habitat, generating new growth and creating more diversity.

See “Fires in Carlsbad Caverns National Park“ in Section 2 – Just the Facts.

Suggested Pre-Visit Procedure

1. Divide the class into groups of five.
2. Instruct students to brainstorm about the negative and positive aspects of fires on an ecosystem. (Each group should have one facilitator, one recorder and one presenter.)
3. Allow each group to make a presentation to the class about their brainstorming session.

Suggested Field Trip Procedure

1. Take students on a field trip to several burned areas and some unburned areas of Carlsbad Caverns National Park. (Call the park to find out where these areas are and when they were burned.)
2. Have students make and record their observations of each area. They should record plant species, wildlife observed and evidences of wildlife. Evidences might include some,

or all, of the following: paw prints, animal waste materials, animal remains and/or habitats.

Suggested Post-Visit Procedure

1. Have students gather in their previously assigned groups.
2. Instruct students to collectively evaluate the positive and negative effects of fires on both the plants and the animals. Have students identify both short and long-term benefits and harms.
3. Instruct groups to prepare formal programs to present their findings to science classes. Students are to use a variety of technologies/visual aids/media to interpret their investigations.
4. Arrange scheduling with other teachers for students to make presentations in their classrooms.

Fire on the Run

Pre-Visit or Post-Visit Activity

Primary/Elementary Levels

Science (Unifying Concepts, Physical, Science in Society)

45 Minute

Objective(s)

- Students will describe fire lines and back-burns
- Students will list ways fires can start
- Students will explain how fire lines and back-burns can be useful in fighting fires

Related NM Content Standards with Benchmarks. SC2-E3, SC9-E1, SC16-E3

Method. Students play a modified version of "Red Rover, Red Rover."

Material. large blank adhesive labels, markers

Key Vocabulary. fire line, back-burn

Background. See Fires in Carlsbad Caverns National Park fact sheet.

Suggested Procedure

1. Explain what a fire line and back-burn are and how they can be useful in managing fire. A good fire line can hold back the approaching fire. Brainstorm things that can *jump* a fire line or even start a new fire. (Example: sparks jumping the line, burning logs rolling across the line, burning limb overhanging the line, lightning, convection heat, conduction heat, radiated heat, matches, cigarette butt, campfire, arsonist, backfire, etc.)

2. With a bold marker, write the names of each of the *fire starters* that were brainstormed onto separate adhesive stickers. Divide the class into two groups, the fire line and the fire starters. Give each fire starter a sticker to wear. Tell them they will represent what is written on their stickers. Have the fire starters line up on one side of the playing field facing the other end of the field. Tell the second group that they will represent the fire line. Their job is to keep the fire starters from crossing the fire line. The members of the fire line stand in a line at the opposite end of the playing field and link hands.

3. To begin, the fire line asks in unison, "Fire Mass! Fire Mass! Let (name of a fire starter, such as "matches") try to pass!" When a fire starter's name is called, the student representing that name runs and tries to break the link of hands in the fire line. If the fire starter is successful, he/she gets to take one person from the fire line back with him/her. The new fire starter is given a sticker to represent a fire starter. If the fire starter is not successful breaking through the fire line, he/she must stay and become part of the fire line. Repeat this several times.

4. As an extension, add a back-fire. Divide the fire line into two groups. Have the first half of the group stand in a line. Place the second half of the group in a line just behind the

first group, linking hands. The first line is the fire line. The second line is the back-fire. Repeat the game, except the fire starters not only have to break the fire line, but also the back-fire.

Firefighting

Pre-Visit or Post-Visit Activity

Primary, Intermediate and Secondary Levels

Science (Science in Society), Language Arts (Receptive Language)

2 Hours

Objective(s)

- Students will discuss firefighting equipment used at Carlsbad Caverns National Park.
- Students will explain how fires start in this area of the Chihuahuan Desert using as their visual the three legs of the fire triangle.

Related NM Content Standards with Benchmarks. SC16-E1, SC16-E2, SC16-M2, SC16-H2, LA3-E3, LA3-M3, LA3-H3, LA4-E7

Method. Through slides, demonstrations and activities, students learn about fire.

Materials. video entitled “Introduction to Fire Behavior,” VCR, fire truck, fire equipment

Key Vocabulary. prescribed burn, management ignited fire, wildland fire, wildfire, Pulaski, Nomex

Background. Read Fire at Carlsbad Caverns National Park fact sheet.

Suggested Procedure

1. Conduct a KWL (what I KNOW, what I WANT to know, what I’ve LEARNED). Ask students what they know about fire behavior. Have students discuss in partners and record on the KWL chart. Introduce a fire triangle and fire related vocabulary. Tell students to focus on recreation hazards, occupation hazards, and weather-related hazards.
2. Show students “Introduction to Fire Behavior.” (For a copy of the video, contact Fire Management Officers at your area United States Forest Service or a park ranger at a nearby National Park. The video explains the fire triangle, types of equipment and the visible changes to the ecosystem after a fire.)
3. Invite a wildland firefighter to your class to demonstrate proper use of fire tools and equipment and to show students his/her wildland fire truck.
4. Teacher probes students with questions.
    - What is a healthy force of nature?
    - What types of fires are there?
    - What is meant by fire behavior?
    - What are the forces of nature?
    - What could you do as a visitor in regards to fire?

5. Have students individually think about the KWL. Pair students to compare their thoughts. Square students by combining two pairs and continue discussion. Have students record thoughts on KWL chart.

Spark!

Pre-Visit or Post-Visit Activity

Primary/Elementary Level

Science (Unifying Concepts, Science in Society), Art (Theatre)

Two 45-Minute Sessions

Objective(s). Students will model how fires grow and how they are controlled by fire fighters.

Related NM Content Standards with Benchmarks. SC2-E3, SC16-E3

Method. Students will play the role of trees, fire fighters, animals and sparks in the face of advancing fire.

Materials. Nomex shirts or yellow arm bands, blue bandannas or nerf balls (enough for 1/4 of the group)

Key Vocabulary. spot fires, fire line, Nomex, direct attack, containment, fuel, creeping fire, crown fire

Background. Forest fires start small. They only grow and spread if favorable fuels, heat and oxygen are available. In windy conditions, embers blown from the main fire can start new fires or spot fires. By removing fuels from an advancing fire's path, fire fighters can slow its growth. Effective fuel removal can be achieved by cutting and removing trees most likely to burn. Fire growth can also be slowed by using water. Water robs fire of much of its heat. Water or chemical drops on a large forest fire rarely put flames out entirely, but may slow the fire enough to contain and surround it through the construction of a fire line.

Suggested Procedure

1. Designate one child as the *spark* (or lightning) that starts the fire. One quarter of the group will be fire fighters, dressed in *Nomex* shirts (special protective clothing of a flame-resistant fabric) or yellow arm bands. Each is equipped with a blue bandana or nerf balls in the shirt pocket to symbolize *water*. Remaining students will be trees (fuel) which allow fire to grow and animals.

2. Explain to the players what each of their roles will be. Have the *spark* go to one end of the playing area, and align the fire fighters at the other end.

3. Have *trees* take root and grow anywhere they wish on the playing field. They should stand with their arms held up to mimic tree branches.

4. Instruct the *spark* to start the game by tagging a *tree*. *Trees* may not run from the fire—they have roots! Tagged *trees* become part of the fire and must join hands with the *spark*. The fire must now continue its pursuit of *trees* as a unit, attempting to capture *trees* with their free hands. Captured *trees* must join the chain of fire. Fire can move either as a long chain or may break into several smaller groups and travel as *spot fires*. But they may not travel as individuals.

5. Instruct fire fighters to stay on the sidelines until the fire has had a chance to grow to at least three or four players. Ask fire fighters, “Do you smell smoke?” When they say, “Yes,” let them go.

6. Fire fighters must avoid the *fire*, while attempting to slow the fire’s growth. They, too, can become the *fire* and must join the *fire* if caught. They can do this in following three ways:

   A. **Removal of fuels** - Fire fighters may tag *trees* and escort them out of the game to the sidelines. Fire fighters and *trees* may not be captured by *fire* en route to the sidelines.

   B. **Direct Attack** - Fire fighters may tag *fire* with their blue bandannas (water). Fire that gets hit with *water* must walk from that point on.

   C. **Containment** - Fire fighters may join hands to encircle or contain a *spot fire*. (Wet fires are easiest to contain because they walk slowly.) Contained *spot fires* must go to the sidelines.

7. Summary of Goals of Players

   - **Tree**
     - Stand still.
     - May be captured by either *fire* or removed to the sidelines by firefighters.
   - **Fire**
     - Tag *trees* and firefighters so they can grow!
     - Avoid water wielding fire fighters.
   - **Fire Fighter**
     - Remove trees to the sidelines before they are captured by fire.
     - Tag fire with water to slow its advance.
     - Join hands with other firefighters to encircle spot fires and remove them to the sidelines.

8. End of Game. The game is over when no trees remain. Compare the number of fire players left at the end of the game with the number of tree players on the sidelines. Who won? Fire fighters or the fire? Point out similarities in real life.

9. Interview a fire fighter. Have a group of students be reporters. Find out what caused the fire. How could it have been prevented? Was it a low creeping fire or a crown fire? How many acres burned? What direction did the fire come from? What direction did the fire go?

10. Interview the trees, plants and animals. Did the animals lose their home? Where did they live and what will happen now?

11. Have students write an article based on the above findings. Draw pictures and make this a supplement to a school newspaper or have the class produce its own newspaper.